

INTRODUCTION

Various types of data can be animated through EnSight’s flipbook capability. During the flipbook load process, selected parts are automatically rebuilt based on some criteria (such as a delta for a clipping plane). For each step, a graphical “page” is created and stored in memory. When the flipbook is active, the pages are displayed in order as rapidly as the hardware allows (although you can slow it down). You can also step through pages manually.

The graphical pages can be one of two types: *object* or *image*. An object flipbook saves each page as 3D geometry so you can continue to manipulate the model (e.g. rotate or zoom) during playback. However, for very large models and/or long sequences, the memory requirements can be substantial. In this case, you can create image flipbooks that save only the image pixels for each page. Although the size of each page is now fixed, you cannot change the viewing parameters without reloading the flipbook.

There are three distinct types of flipbooks:

Transient	Pages are constructed by stepping from the current beginning to ending time range and rebuilding all time-dependent parts based on each time step in sequence.
Mode Shapes	Pages are constructed by applying a cosine-driven scaling factor to a displacement variable.
Create Data	Pages are constructed by applying a delta to either a clip part or an isosurface.
Linear Load	Pages are constructed by applying linear interpolation ranging from zero to the maximum (displacement) vector field value.

This article covers only the “Create Data” type of flipbook. See [How To Animate Transient Data](#) for details on transient flipbooks. See [How To Display Displacements](#) for details on mode shape flipbooks.

For more sophisticated animations, use EnSight’s [keyframe animation](#) capability.

BASIC OPERATION

For each page of the flipbook, a delta value will be applied to all active clip parts and isosurfaces. For clips, the delta represents a translation vector; for isosurfaces it is an increment to the isovalue. There are two ways to specify these delta values: either through interactive manipulation or via the applicable Feature Detail Editor for the part. The former method is discussed below, the latter in the [Other Notes](#) section at the end.



Prior to loading the flipbook, you should create all parts that you wish to animate (**clips** and/or **isosurfaces**) and manipulate the part so that it is in the desired location for the start of the flipbook. To load the flipbook:

1. Click the Flipbook Animation icon in the Feature Icon Bar.



2. Be sure the Load Type is set to Create Data.

3. Select the desired page type (Object or Image).

4. Set the desired number of pages.

The delta value will be added to the appropriate entities for each page.

5. Click Start to begin recording interactive part manipulations.

The dialog box contains the following elements:

- Load Type:** A dropdown menu set to "Create Data".
- Load As:** A dropdown menu set to "Objects".
- Number of Flipbook Pages to Create:** A text box containing the value "10".
- Record Interactive Iso/Clip:** A checkbox that is checked.
- Start/Stop:** Two diamond-shaped buttons for starting and stopping the recording.
- Run Type:** A dropdown menu set to "Step".
- Page/Time:** Two text boxes showing "0.0000" and "0.0000e+00".
- Buttons:** "Load", "Record...", "Delete...", "Modify Run...", and "Help...".
- Regen. All Pages:** A checkbox that is unchecked.

- 6a. For clipping plane parts, reopen the Quick Interaction area for the part (double-click on the part in the Main Parts list).

- 6b. Toggle on Interactive Tool, move the mouse into the Graphics Window and interactively position the tool to the desired location for the end of the flipbook.

- 6a. For isosurface parts, reopen the Quick Interaction area for the part (double-click on the part in the Main Parts list).

- 6b. Change the Interactive Pulldown to Manual and adjust the slider until the isovalue is as desired for the end of the flipbook.

7. Return to the Flipbook Quick Interaction area (i.e. perform step 1 again).

8. Click Stop to end recording interactive Iso/Clip.

9. Click Load.



The Load Flipbook Status dialog will open and show the progress of the load. You can cancel the load by clicking the Cancel button and retain all the pages loaded to that point. Once the load is complete, you can run the flipbook:

1. Set the Run Type to Auto.

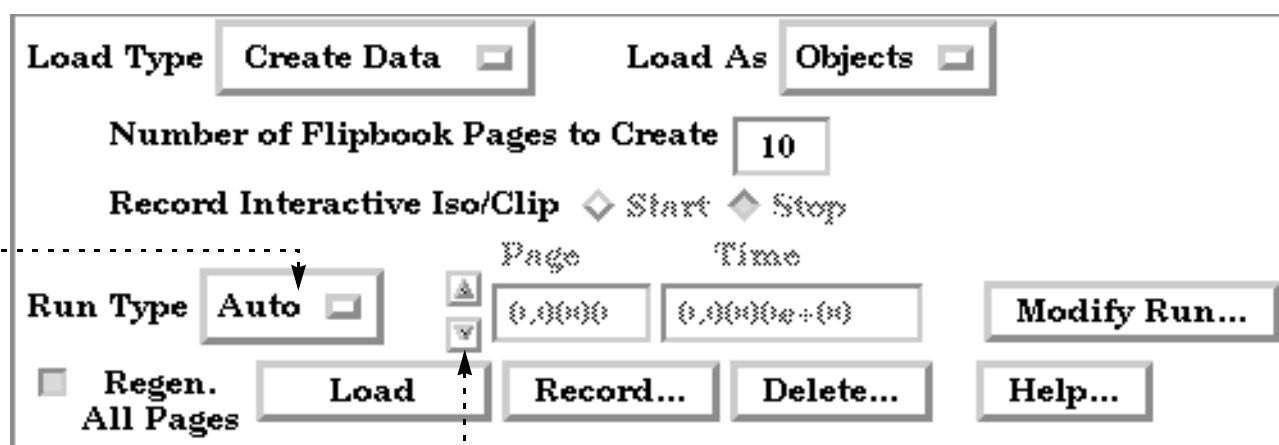
2. Move the mouse cursor into the Graphics Window.

You can also step through the pages manually:

1. Set the Run Type to Step.

2. Click the up/down buttons to change pages. You can also enter values in the Page field (and press return) to jump to a specific page.

3. When done, set the Run Type to Off.



You can control flipbook playback range, speed, and cycle behavior:

1. Click the Modify Run... button to open the Auto Run Settings dialog.

2. To change the range of displayed pages, enter new values in the Show From Page and/or Show To Page fields (and press return).

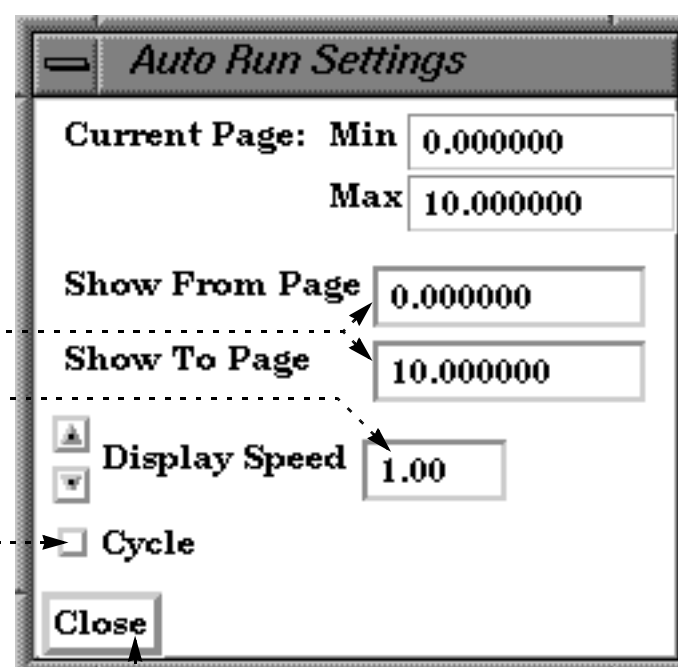
3. To change the display speed, enter a new value in the Display Speed field (and press return).

A speed of 1.00 represents "full" hardware speed with no delays; a value of 0.5 is half of full speed.

4. To cycle the page display, click Cycle.

Cycle will replay the pages in reverse order when the last page is reached.

5. Click Close when done.



Record...

Flipbook images can be recorded to a number of different formats. Available recording file formats:

Apple PICT	Flipbook files saved as sequence of Apple PICT files.
JPEG	Flipbook files saved as sequence of JPEG files.
TIFF	Flipbook files saved as sequence of TIFF files.
PCL	Flipbook files saved as sequence of Page Control Language files.
PostScript	Flipbook files saved as sequence of PostScript files.
Silicon Graphics RGB	Flipbook files saved as sequence of SGI RGB files.
TARGA	Flipbook files saved as sequence of TARGA files.
CEI RGB with depth	Flipbook files saved as sequence of RGB files with depth.
EnVideo	Flipbook files are saved to EnVideo file.
MPEG	Flipbook files are saved to an MPEG file.
AVI	Flipbook files are saved to an AVI file.

Delete

Any type of flipbook can be deleted:

1. Click **Delete...** in the **Flipbook Quick Interaction Editor**.
2. Confirm the deletion.

All memory associated with the flipbook is freed.

OTHER NOTES

Rather than specify the part delta values through interactive part manipulation as described above, you can set the values explicitly using the Feature Detail Editor for the part. For clip parts:

1. Select **Edit > Part Feature Detail Editors > Clips...** to open **Feature Detail Editor (Clips)**.
2. Select the desired part in the parts list of the **Feature Detail Editor (Clips)**.
3. In the **Animation Delta** section, enter the desired values in the **X, Y, and Z** fields and press return.

For isosurfaces:

1. Select **Edit > Part Feature Detail Editors > Isosurfaces...** to open **Feature Detail Editor (Isosurfaces)**.
2. Select the desired part in the parts list of the **Feature Detail Editor (Isosurfaces)**.
3. In the **Animation Delta** field, enter the desired **isovalue delta** value and press return.

When a flipbook is subsequently loaded, active clips and/or isosurfaces will update based on these animation delta values.

Since both object and image flipbooks build pages from the current set of parts based on their current attributes, if you make a change (such as color a part by a different variable or create a new part), you must reload the flipbook. There are exceptions. With an object flipbook, you can make a part invisible while the flipbook is running.

SEE ALSO

User Manual: [“Flipbook Animation” on page 71](#)